

THE STUDENT, THE COLLEGE AND SUCCESS: GOAL ATTAINMENT THROUGH DATA EMPOWERMENT

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ABSTRACT

Efficiency, effectiveness and accountability in college education are concerns for many stakeholders from students to legislators. Achieving these goals, however, must begin with an analysis of student experiences in college and first year educational outcomes. A decade of such research has illuminated the dynamic interaction between students, the college experience and will review the results of these studies and demonstrate a bilingual information system designed to empower CEGEP decision makers and maximize the success of both students and colleges.

ACHIEVING GOALS

Efficiency, effectiveness and accountability in college education are concerns for many stakeholders from students to legislators. Students, for example, are beginning to demand quality in the educational services they purchase and perceived failures have resulted in litigation to recover damages. Provincial legislators have begun to examine, or have enacted, policies targeted at ensuring excellence and accountability. In spite of this increased demand, however, college staff are finding the levers of change to be cumbersome and often ineffective.

The advent of the "Information Age" has given many cause for hope. The development of high-powered, user-friendly P.C. systems has made actualizing the concept of "data empowerment" a real possibility. Liberating information from the restrictive confines of management information systems and making it available to many for the purposes of policy development and decision-making can help support goal attainment in a new and dynamic way. These "decision support systems" integrate diverse sources of information and make it available for everyday use by all college constituents. Such tools, however, are uncommon.

Humber College, a large Toronto three-year career college, has long been committed to continually improving efficiency, effectiveness and accountability. It has done so by focusing on students with the premise that college success is in large measure defined by the success of its

students. The college has supported this goal by creating a match or "fit" between each student and his or her educational experience. The approach has been developed from a widely used framework for student success/retention research. The "person-environment fit" model argues that educational outcomes are generally the product of an interaction between student and institutional characteristics (Dietsche, 1990, Tinto, 1987). To the extent that institutional characteristics (the nature of the learning environment) match student characteristics (needs, goals, abilities, interests, attitudes), outcomes such as student success and retention are encouraged. A poor match results in low levels of these outcomes.

Creating this match has been achieved via a two-pronged approach including several strategies initiated during the freshman year. Each prong emphasizes providing information for decision-making by students and college personnel. This includes:

- a) pretesting to ensure that students possess the basic skills (literacy, numeracy) required to succeed in college programs.
- b) measuring non-intellective freshman characteristics which, via empirical research, have been found to influence student success.
- c) providing student advisers with a comprehensive student database that identifies the probability of drop-out and priority support needs.

It is the resulting decisions and behaviours on the part of each constituent group which ultimately create customized learning environments. How this is achieved will be discussed later in this paper.

THE STUDENT, THE COLLEGE, AND EDUCATIONAL OUTCOMES

The empirical rationale for the above approach is derived from research on educational outcomes at Humber College over the past twelve years. The data presented below are the results of research on the determinants of educational outcomes for the 1986, 1991, 1995 and 1996 freshman cohorts. The sample size exceeds 12,000 students.

While early studies on outcomes attempted to identify differences between either successful and unsuccessful students or persisters and dropouts, many researchers have adopted a new approach. This method defines first-year outcome groups in terms of academic performance and registration status. With each variable expressed in a binary form (success vs failure; persistence vs withdrawal), it is possible to examine four types of outcomes. These are: academic success and persistence; academic success and departure; academic failure and persistence; and, failure and departure.

At Humber, information on student background characteristics, college experiences and changes in attitudes and behaviour was gathered and analyzed for the four groups

identified above. The discussion which follows focuses on persistence vs departure and illustrates the complex and dynamic interaction between student characteristics, college experiences and educational outcomes. These data are summarized in Table 1 where grey shading identifies differences between student success.

Academic Success and Persistence vs Departure

Previous research (Dietsche, 1990; Pascarella & Terenzini, 1991, Tinto, 1975, 1987) has shown that academically successful students can choose to either persist or leave their college of attendance. What factors influence the choice made by students?

Table 1

Type	Student Characteristic	First Year Outcome			
		Success and Persistence	Success and Departure	Failure and Persistence	Failure and Departure
Entry	High School Program	advanced	advanced	general	general
	High School Involvement	highest	2nd highest	2nd lowest	lowest
	Language Skill	2nd highest	highest	2nd lowest	lowest
	Occupational Certainty	highest	lowest	2nd highest	2nd lowest
	Orientation to Job	2nd lowest	highest	lowest	2nd highest
	Confidence in Success	highest	2nd highest	2nd lowest	lowest
Experience	Perception of Program	highest	2nd lowest	2nd highest	lowest
	Academic Involvement	highest	2nd highest	2nd lowest	lowest
	Interaction with Peers	highest	2nd highest	highest	lowest
	Interaction with Faculty	highest	2nd highest	2nd lowest	lowest
	Use of College Services	2nd lowest	lowest	2nd highest	highest
Changes	Academic Involvement	largest increase	2nd largest increase	no change	no change
	Occupational Certainty	no change	2nd largest decline	no change	largest decline
	Value of Education	no change	2nd largest decline	increase	largest decline
	Orientation to Job	no change	2nd highest increase	small increase	largest increase
	Confidence in Success	no change	2nd largest decline	small decline	largest decline
Impact	Educational Commitment	no change	largest decline	no change	2nd largest decline
	Institutional Commitment	small decline	largest decline	small decline	2nd largest decline
	Intent to Change	lowest	2nd highest	2nd lowest	highest

Background Characteristics

At college entry, students who were successful and persisted differed little from those who were successful and eventually left. Both groups were well prepared academically, had strong language skills and were high in confidence; traits typically associated with success. The leavers, however, were less clear about their future occupation and were more receptive to leaving college for a full-time job. Thus, those who left in the first year entered college uncertain about the type of work they would have after graduation and the relationship between their program and this uncertain future. They were also more likely to say they would leave college if offered a job.

College Experiences

This variation in student characteristics at college entry can have significant implications for first year outcomes. And while the experience of college is as diverse as the individuals who attend, a comparison of these experiences for successful persisters and leavers identified a distinct pattern. Generally, it was found that variation in key entry characteristics can lead to different college experiences and, consequently, different educational outcomes.

For example, an examination of first-term experiences showed that leavers, despite being similar to persisters in their high level of social and academic involvement, were less positive about their program at mid-term. Fewer said their program was exciting and more agreed what they were learning was irrelevant. Further analysis confirmed that uncertainty about future career goals and directions, as exhibited by the departure group at college entry, significantly influences students' perceptions of their program.

Changes in Behaviour and Attitudes

First year experiences will also have an impact on students' behaviour and attitudes toward college education. Measuring attitudes and behaviours at entry to college and again at mid-semester can provide additional insight into the factors which precipitate student decisions to change program, change college, or leave postsecondary education.

In the Humber studies, the attitudes of new students toward their future career (occupational certainty), leaving college for a full-time job (job orientation), the value of their college studies (value of education) and their confidence in success were measured in this way. Alterations in academic behaviour (studying, doing homework) between high school and college were also examined. In all these areas significant mid-term group differences and changes over time were observed.

By mid-term, the attitudes of the departure group had

changed dramatically. In spite of their academic success, they were now more uncertain about their future career, less confident in their success, perceived their education as less valuable and were more inclined to say they would leave college for a full-time job than when they began their studies. In contrast, the persister group exhibited no change in any of these areas.

Impact on Students

These data illustrate how students who differ at college entry can have diverse experiences of their program, for example, which result in attitudinal and behavioural changes over time. While the specific sequence of these events has yet to be determined, additional data showed the impact these changes had. It is clear that students' experiences over the first year influence their attitudes and, ultimately, their behaviour.

Specifically, different outcome groups exhibited dramatic changes in their attitudes toward continuing their college education or remaining at their college of attendance. Essentially, such changes constitute the attitudinal precursors of behaviours students typically use to cope with negative experiences in college. These behaviours include changing programs, changing colleges or dropping out. Many of these intentions were evident in students at mid-term.

For example, commitment to education and to their college of attendance decreased in leavers while their intention to change program, change college or drop out was high. And, indeed, this is what the departure group did. The persisters, on the other hand, remained committed to their education and their college and were lowest on the intent to change measure.

Failure and Persistence vs. Departure

Students who fail academically can persist on probationary status or choose to leave college. An analysis of these groups showed that the events leading to departure in failing students were similar to those for successful students.

At college entry, the persisters and leavers were alike in their poor academic preparation and involvement in high school, weak language skills and lack of confidence in success; traits typically associated with failure. Major differences were observed, however, in the persisters' higher level of occupational certainty and lower receptivity to leaving college for a full-time job compared to the departure group.

College experience for the two groups differed in that the persisters perceived their program positively and were in-

involved with peers, whereas the leavers were low in peer interaction and had less positive perceptions of their program. Dramatic differences were also observed in attitudes. At mid-term, the persister group valued a college education highest, were highly certain about their future career, and confident in their success. Those who left, in comparison, were low in all these areas.

Entry to mid-term changes in attitudes also differentiated the groups. The leavers became more uncertain about their future career, perceived a college education to have less value than when they entered, were much less confident in their success and were more receptive to leaving college for a job.

In addition, their commitment to education and their college decreased. The persister group, on the other hand, was quite different. They were as certain about their future career at mid-term, perceived college education as having more value and were only slightly less confident in their success. There was no change in their commitment to education, only a small decline in their commitment to their college and their intention to change program, change college or drop out was low.

Summary

The foregoing comparison of students who persist with those who leave college, irrespective of whether they are academically successful or not, illuminates the sequence of events leading to departure. It is clear that certain student characteristics at college entry, such as occupational uncertainty, can lead to negative experiences which cause students to question their educational goals and directions and, in some cases, precipitate decisions to change college or depart postsecondary education altogether.

STUDENT DIVERSITY AND EDUCATIONAL DELIVERY

Given the diverse nature of entering college students, the traditional "one size fits all" type of education is ineffective and inefficient. A basic principle of systems theory is that only variety can absorb variety (Ashby, 1965). In the context of higher education, this means that students who differ in critical entry characteristics, both cognitive and non-cognitive, must be presented with different learning environments. A unidimensional and inflexible delivery of college education will result in some students being successful and others not (Dietsche, 1995).

This, of course, has generally been the nature of higher education, and, in fact, failure or departure have long been held as criteria of quality and hallmarks of high standards. Not so long ago, the Dean's address to freshmen at orien-

tation was "Look to your left and to your right, a year from now only one of you will still be here".

Data Empowerment: Freshman Integration and Tracking System

A student data base, called the **Freshman Integration and Tracking System (FIT System)**, is a decision support system for students, faculty advisers/counsellors and program directors. It facilitates fine tuning of admissions standards, timely and well informed freshman advising and support service planning. Ultimately, FITS helps advisers engage students as full partners in their learning — ensuring the student/program match, retention, and passing grades. In short, it facilitates student success.

The **FIT System** consists of two measurement instruments: information derived from college student records (results of basic skills tests, mid-term and final grades, enrollment status) and a Windows-based software package consisting of a database, a graph engine and a report generator.

The first instrument, the *Partners in Education Inventory*, is administered at entry to the college and provides information on the demographic characteristics, academic background, support service needs, attitudes and goals of new students. This is used to: 1) match and target college support services to self-identified student needs via a computer-generated "**Partners in Education Report**" delivered to each new student. Students use this information to help decide what college services to use and how to use them. 2) report student needs information to appropriate college staff (faculty advisers, counsellors) as the basis of a proactive/intrusive advising system; 3) act as an "early-warning" system identifying students with a high probability of failure/departure in the first semester.

The second instrument, the *Student Experience Inventory*, is administered at mid-semester to examine the college experience and constitutes the "tracking" component. This instrument provides information on the support needs, academic and extracurricular behaviour, perceptions and attitudes of individual students following their interaction with college academic and social environments. This is used to: 1) match and target college support services to self-identified student needs via a second computer-generated "**Partners in Education Report**". This provides a second opportunity to help students decide what college services to use and how to use them. 2) provide student needs information to college staff as the basis of continued proactive advising; 3) act as an "early-warning" system identifying at a critical juncture those students with a high probability of failure/departure; 4) identify students who have, since registration, undergone dramatic changes

in their attitudes toward and perceptions of a college education.

Interventions based on this information such as the entry and mid-term Partners in Education Reports are designed to integrate the student into the college environment, identify and solve problems before they precipitate departure decisions and, ultimately, increase student retention and success.

Information in the database from the two student inventories is linked as well to the results of objective tests at college entry and to grades and enrollment status. This information provides decision support for senior academic administrators, program chairs and planning staff. Using the **FIT System** graph and report tools, managers are able to, in a timely and user-friendly fashion, examine the student experience of their programs, determine the characteristics of success/failure and persistence/departure and make any necessary adjustments or modifications to promote increased levels of success.

CONCLUSIONS

The Freshman Information and Tracking System (FITS) is a powerful tool in the campaign for freshman retention and success. It provides program managers and faculty advisers with the timely information needed to counsel freshmen, to plan remedial and student support services and to encourage strong academic performance. In equal partnership, the system provides students with concise, timely and personalized feedback that helps them make decisions related to their own success in the freshman year.

The data base also provides a method to statistically validate student selection criteria. This is particularly critical in an age when many students are underprepared and many employers are demanding that graduates possess progressively higher skills. Humber College has found that this research has been a powerful tool through which secondary school leaders can be engaged in enhancing the school to college transition. Discussions of the research point out the importance of student preparation in basic generic skills, the value of selection criteria that admit those who

have a high probability of success and the benefits of delivering quality, customer-oriented academic programs and services.

The questions raised in our quest for "quality" can only be answered by research. The **FIT System** has been found to be a research and management tool rich enough to guide, not only decisions affecting the success of individual students, but college-wide policy as well.

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